

Serial No. 10/642,275
September 8, 2005
Reply to the Office Action dated June 9, 2005
Page 2 of 8

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claim 1 (currently amended): A photo magnetic field sensor comprising:
a Faraday rotator including a paramagnetic material, a polarizer, an analyzer, a light-irradiating element, and a light-sensing element; wherein
~~the Faraday rotator including the paramagnetic material is made of a paramagnetic garnet single crystal including at least~~consisting essentially of an oxide of Tb, and Al and at least one of Pr and Ce.

Claim 2 (canceled).

Claim 3 (original): A photo magnetic field sensor according to Claim 1, wherein the analyzer is arranged on an emergence side of the Faraday rotator and along an optical axis substantially parallel to the Faraday rotator.

Claim 4 (original): A photo magnetic field sensor according to Claim 1, wherein the polarizer is provided on an incidence side of the Faraday rotator.

Claim 5 (original): A photo magnetic field sensor according to Claim 1, wherein the polarizer and the analyzer are arranged such that an optical axis extended through the Faraday rotator passes through the polarization planes of the polarizer and the analyzer.

Claim 6 (original): A photo magnetic field sensor according to Claim 1, wherein the light-irradiating element is arranged such that light falls on the polarizer.

Serial No. 10/642,275
September 8, 2005
Reply to the Office Action dated June 9, 2005
Page 3 of 8

Claim 7 (currently amended): A photo magnetic field sensor according to Claim 1, wherein a first total reflecting mirror is provided between the light-irradiating element and the polarizer.

Claim 8 (currently amended): A photo magnetic field sensor according to Claim 47, wherein a second total reflecting mirror is provided between the analyzer and the light-sensing element.

Claim 9 (currently amended): A photo magnetic field sensor according to Claim 8, wherein collective lenses are provided between the first total reflecting mirror and the polarizer and between the second total reflecting mirror and the analyzer, respectively.

Claim 10 (canceled).

Claim 11 (currently amended): A photo magnetic field sensor comprising:
a Faraday rotator including a paramagnetic material, a polarizer, an analyzer, a light-irradiating element, and a light-sensing element; wherein
the Faraday rotator paramagnetic material has a columnar shape in which a diameter A (mm) in mm of the column of the Faraday rotator and a distance B (mm) in mm between one end of the Faraday rotator and the other end thereof satisfies $0 < A \leq 2$ and $1 \leq B/A \leq 10$; and

the paramagnetic material is made of a paramagnetic single crystal consisting essentially of an oxide of Tb, Al and at least one of Pr and Ce.

Claim 12 (canceled).

Claim 13 (currently amended): A photo magnetic field sensor according to Claim 11, wherein the analyzer is arranged on an emergence side of the Faraday

Serial No. 10/642,275
September 8, 2005
Reply to the Office Action dated June 9, 2005
Page 4 of 8

rotatorparamagnetic material and along an optical axis substantially parallel to the Faraday rotatorparamagnetic material.

Claim 14 (currently amended): A photo magnetic field sensor according to Claim 11, wherein the polarizer is provided on an incidence side of the Faraday rotatorparamagnetic material.

Claim 15 (original): A photo magnetic field sensor according to Claim 11, wherein the polarizer and the analyzer are arranged such that an optical axis extended through the Faraday rotator passes through the polarization planes of the polarizer and the analyzer.

Claim 16 (original): A photo magnetic field sensor according to Claim 11, wherein the light-irradiating element is arranged such that light falls on the polarizer.

Claim 17 (currently amended): A photo magnetic field sensor according to Claim 11, wherein a first total reflecting mirror is provided between the light-irradiating element and the polarizer.

Claim 18 (currently amended): A photo magnetic field sensor according to Claim 11, wherein a second total reflecting mirror is provided between the analyzer and the light-sensing element.

Claim 19 (currently amended): A photo magnetic field sensor according to Claim 18, wherein collective lenses are provided between the first total reflecting mirror and the polarizer and between the second total reflecting mirror and the analyzer, respectively.

Claim 20 (canceled).